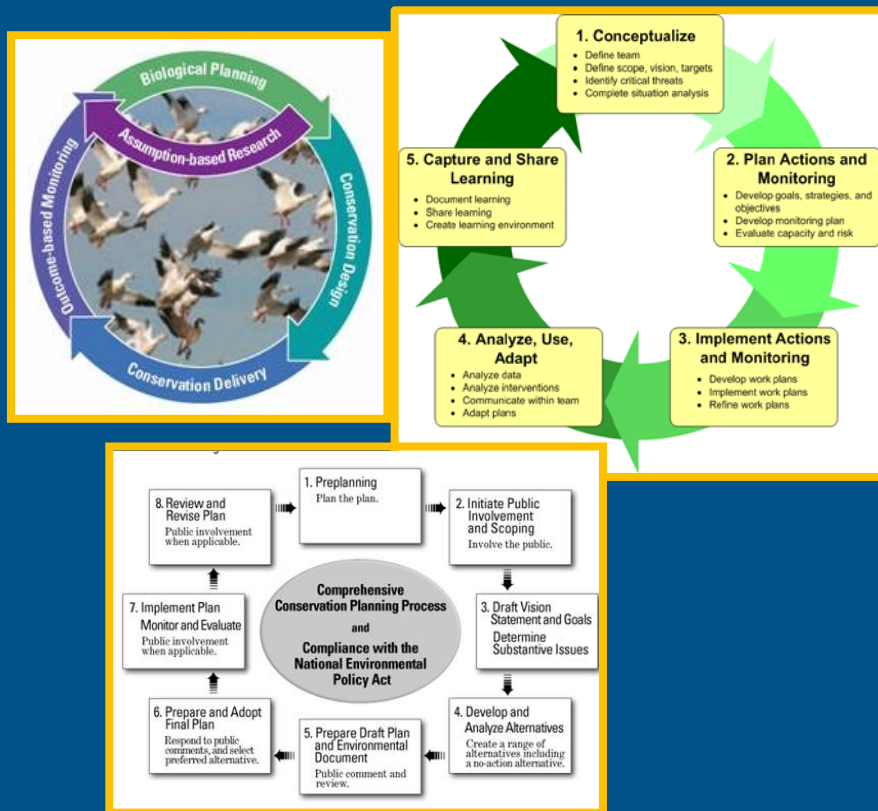


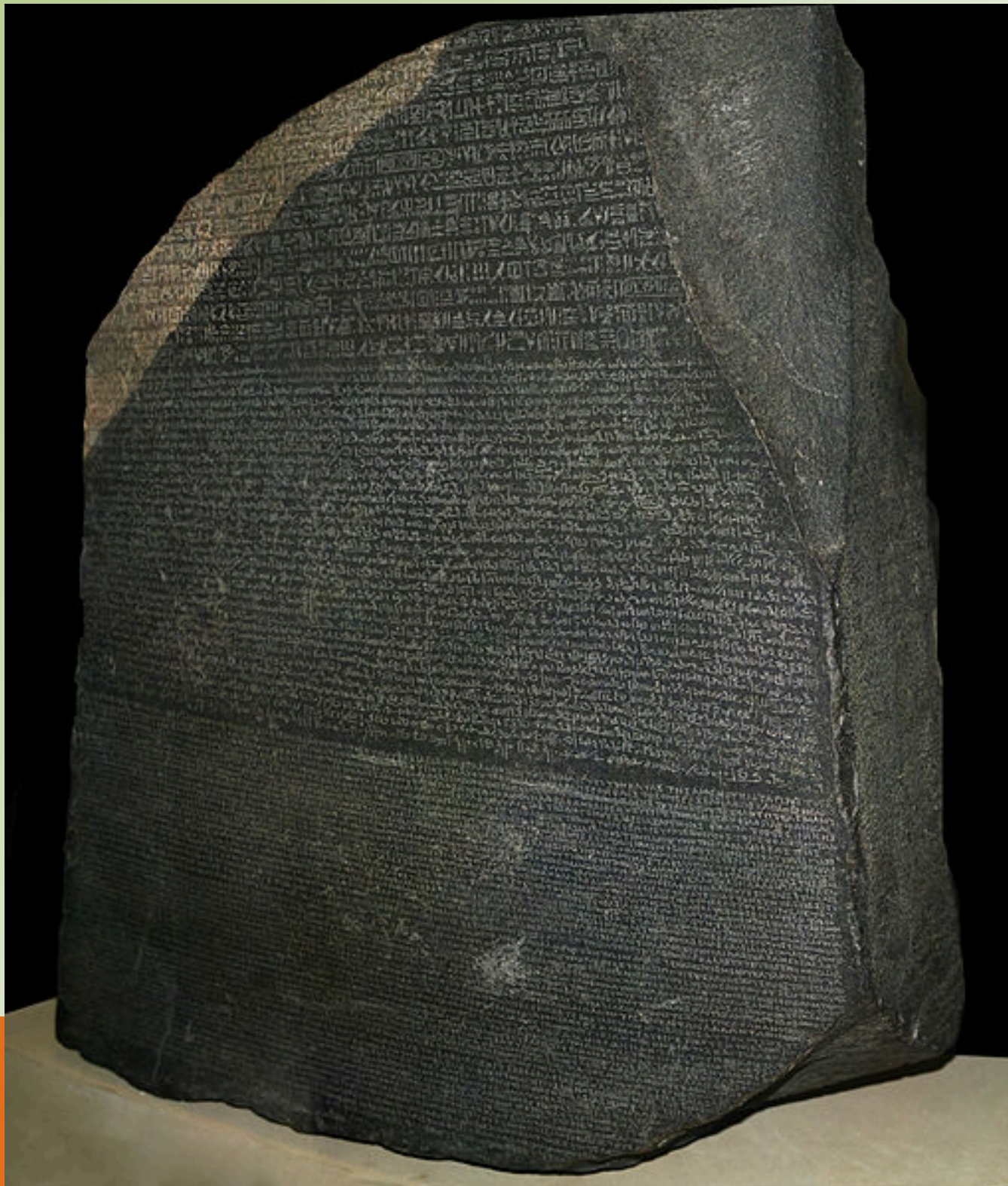


A “Rosetta Stone” For Integrating Climate Change into Existing Planning Frameworks



Aimee Delach
Natalie Dubois
Noah Matson
Defenders of Wildlife

National Adaptation Forum, April 1-3, 2013



Symposium Overview

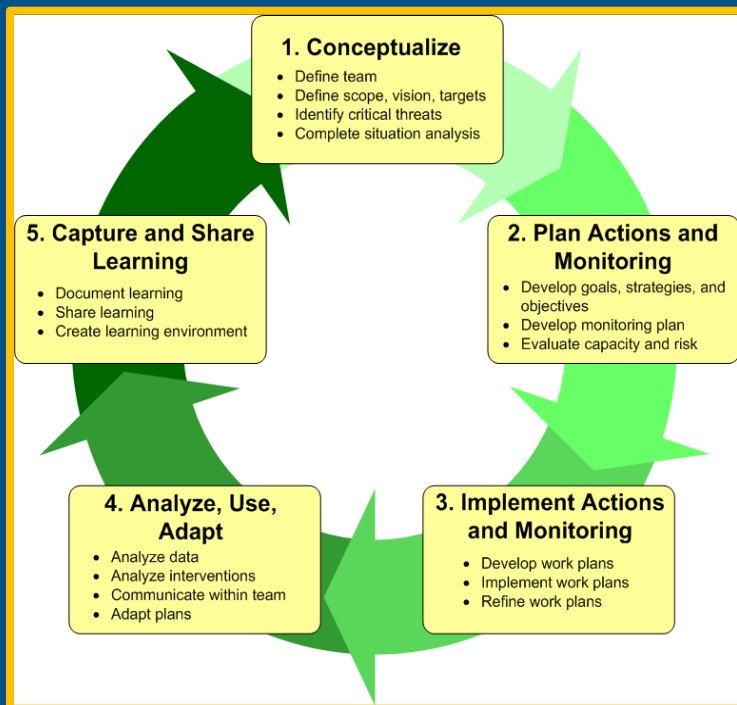
- 8:30 An Overview of the Open Standards Framework and a Model for Integrating Climate Change Adaptation
Applications to State Wildlife Action Planning—Natalie Dubois
- 9:00 Applications to ESA Recovery Planning and National Wildlife Refuge Planning—Noah Matson
- 9:20 Applications to National Forest Planning Under the 2012 Rule and NEPA Planning—Aimee Delach
- 9:40 Discussion period





An Overview of the Open Standards Framework and a Model for Integrating Climate Change Adaptation & Applications to State Wildlife Action Planning

Natalie Dubois



Climate Change



Profound impacts

Action is required



How can we leverage **existing capacity** to ensure that our response is the most **effective** it can be?



2013



NATIONAL *fish, wildlife & plants* CLIMATE ADAPTATION STRATEGY

ACTIONS:

2.1.1: Incorporate climate change considerations into new and future revisions of species and area management plans (e.g., North American Waterfowl Management Plan, National Forest Plans, State Wildlife Action Plans, and agency-specific climate change adaptation plans such as federal agency adaptation plans required by E.O. 13514) using the best available science regarding projected climate changes and trends, vulnerability and risk assessments, scenario planning, and other appropriate tools as necessary.

Goal 2

Manage species and habitats to protect ecosystem functions and provide sustainable cultural, subsistence, recreational, and commercial use in a changing climate.

Strategy 2.1: Update current or develop new species, habitat, and land and water management plans, programs and practices to consider climate change and support adaptation.



THE SECRETARY OF THE INTERIOR
WASHINGTON

2001

ORDER NO. 3226

Subject: Evaluating Climate Change Impacts in Management Planning

2009

ORDER NO. 3289

Subject: Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources

How We Have Dealt with It

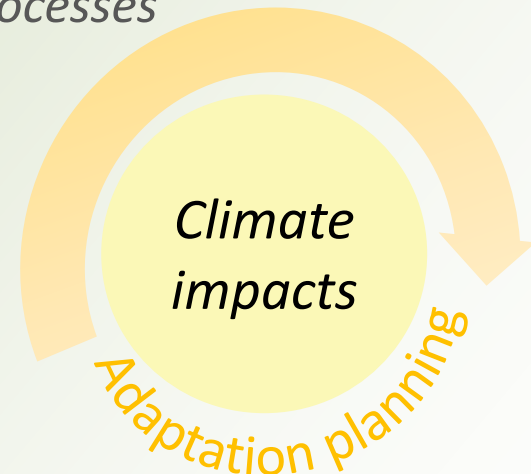
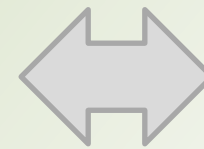
Adaptation as the goal

Separate process using different terminology and frameworks



At best:

Appended to existing conservation planning processes



At worst:

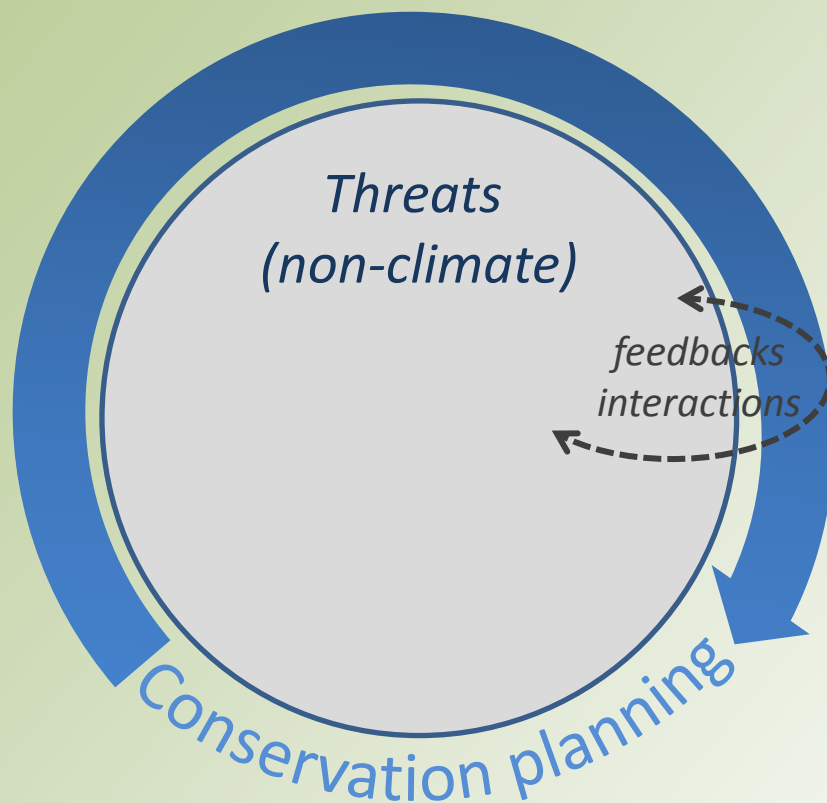
May lead to poor choices, divert investments from more strategic actions, or lead to maladaptive actions



An Emerging Perspective

We can leverage existing capacity by **integrating climate change** into **existing planning processes** in order to ensure the actions we take to respond to these impacts will be the most effective

while increasing the likelihood of adoption & **implementation**

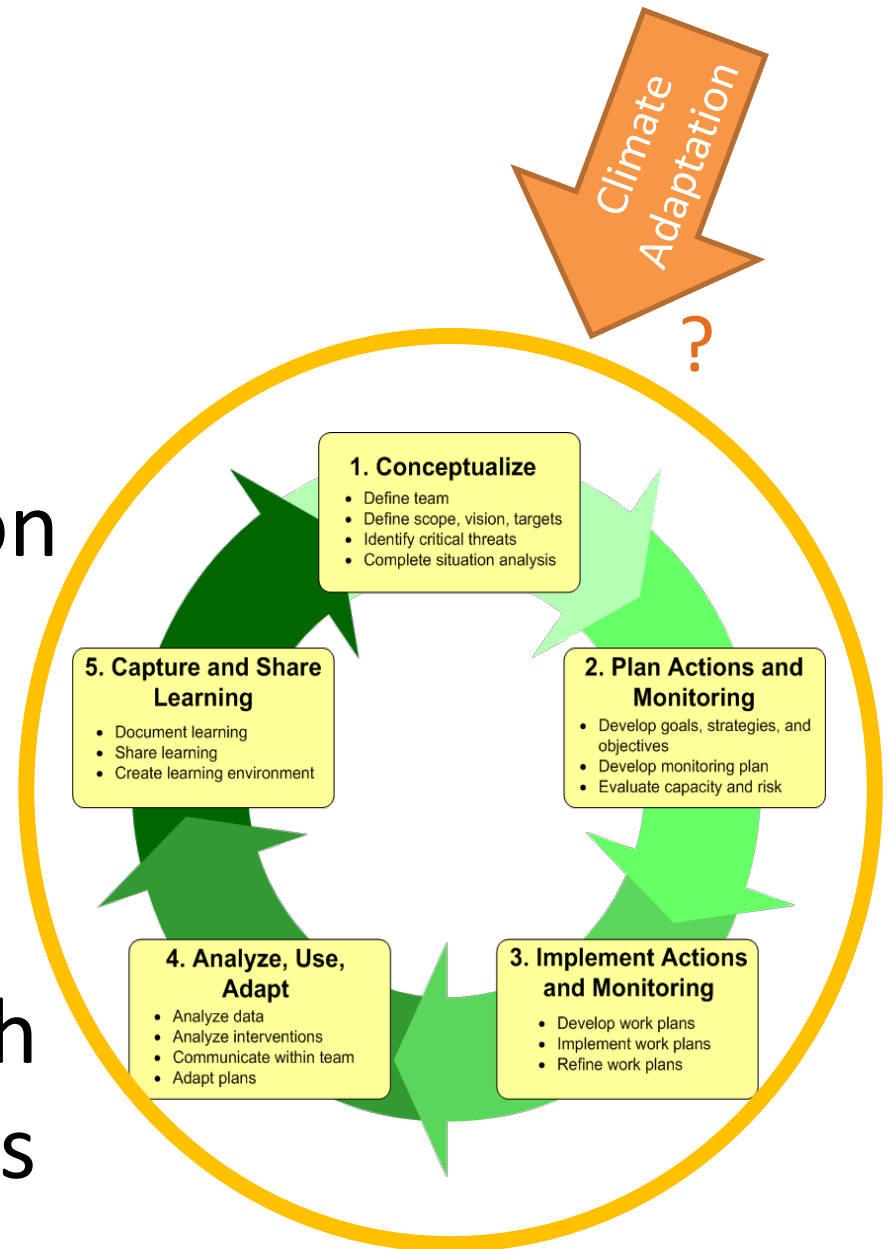




Our premise

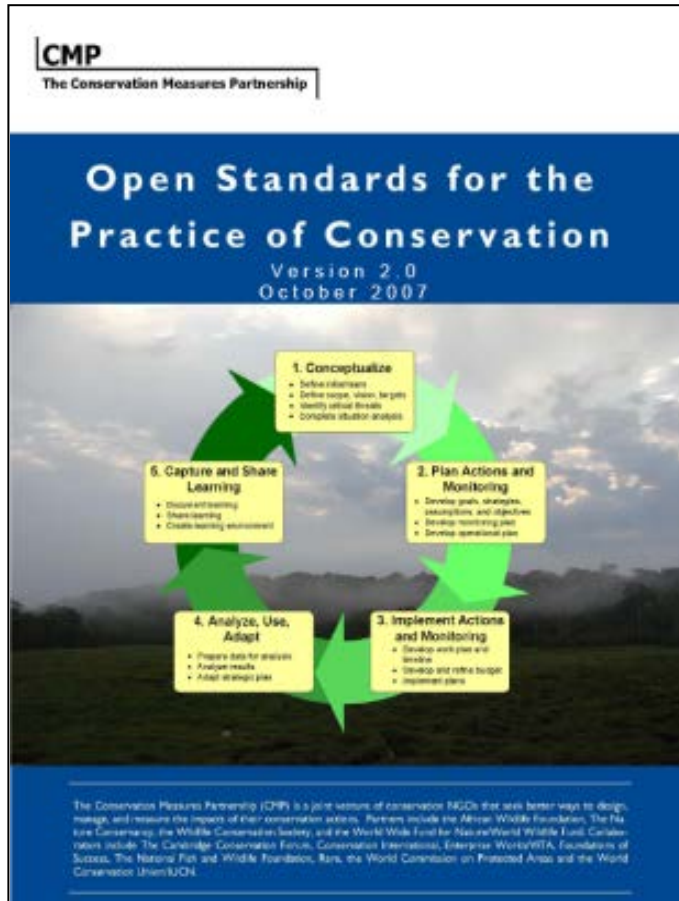
By figuring out where to integrate climate adaptation into the Open Standards...

we could create a “Rosetta Stone” to transfer approach to other planning processes



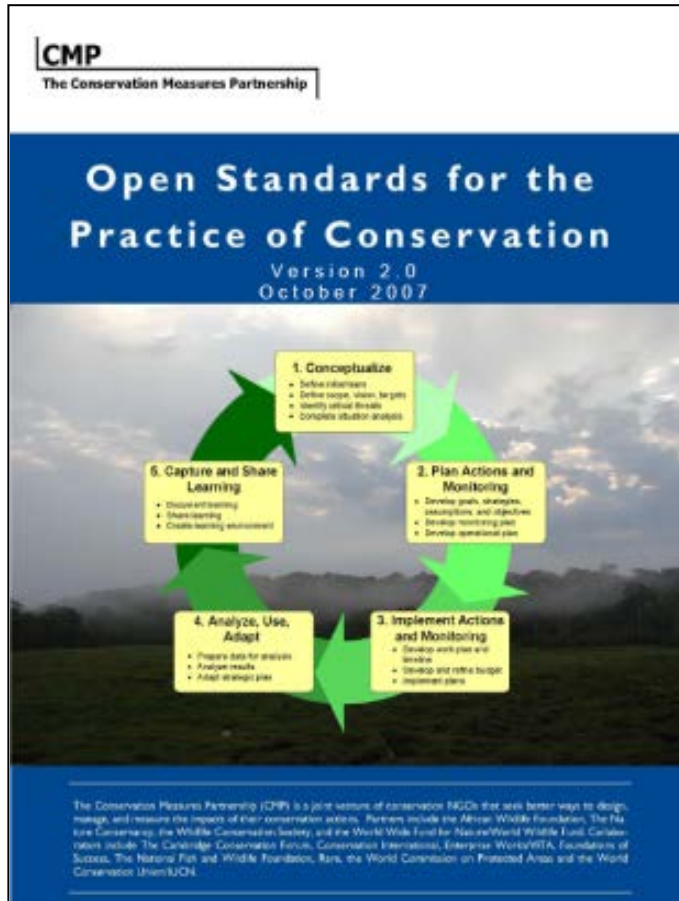
Our starting point

The Conservation Measures Partnership's Open Standards



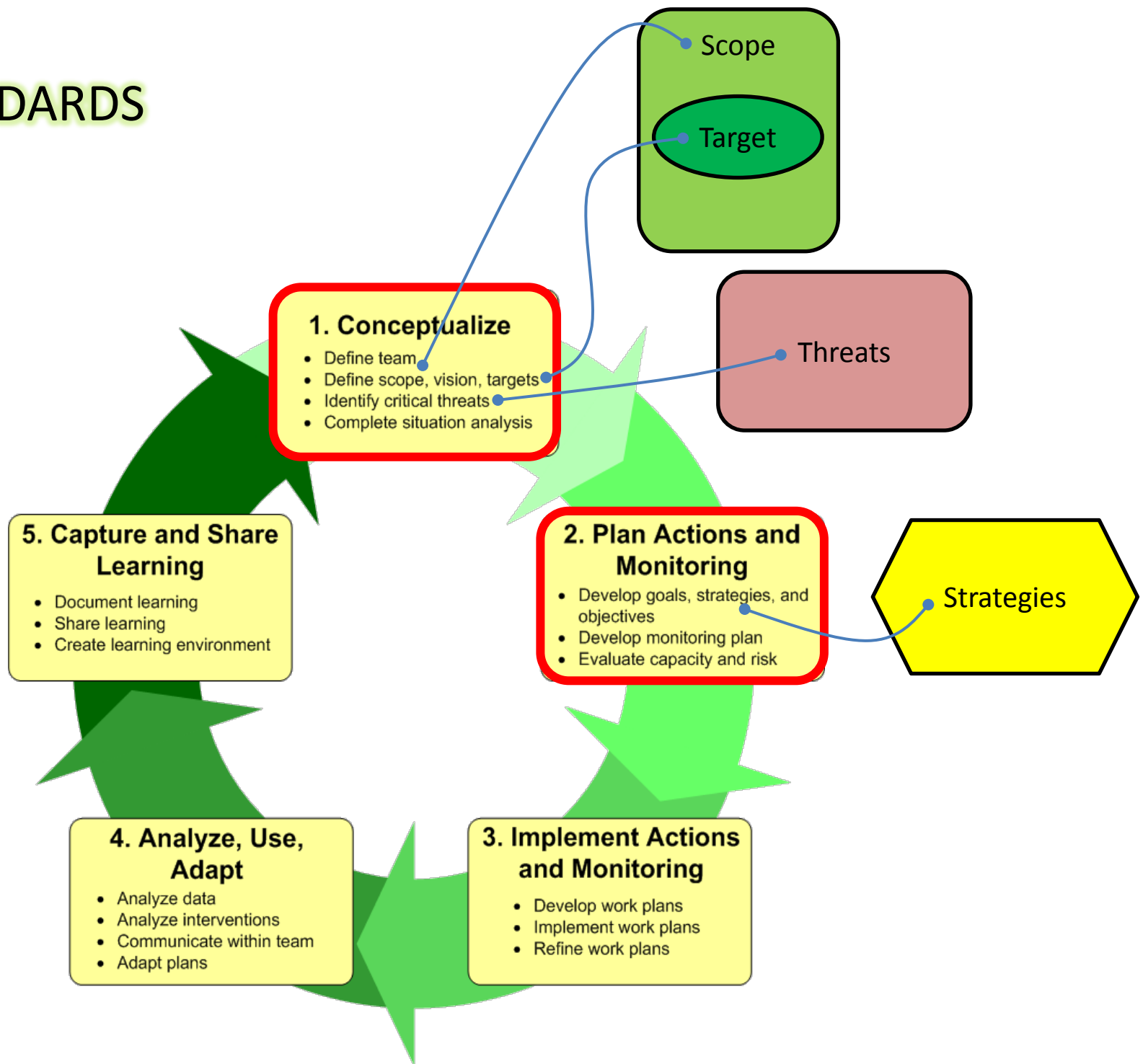
- Adaptive management process developed by leading conservation organizations and agencies
- Brings together common concepts, approaches and terminology to help improve the practice of conservation

Our starting point

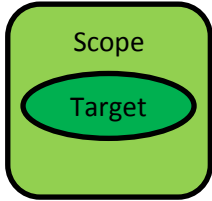




- *Transparent:* Provides a conceptual framework for good project design, implementation, monitoring and evaluation
- *Flexible:* Organization-specific implementation
- *Transferable:* Provides a basis for a common language across organizations

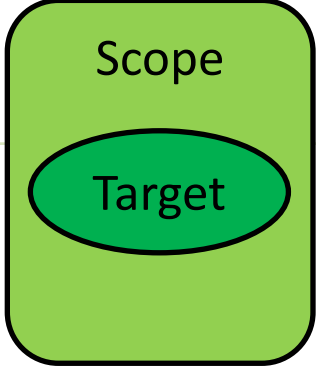
OPEN STANDARDS



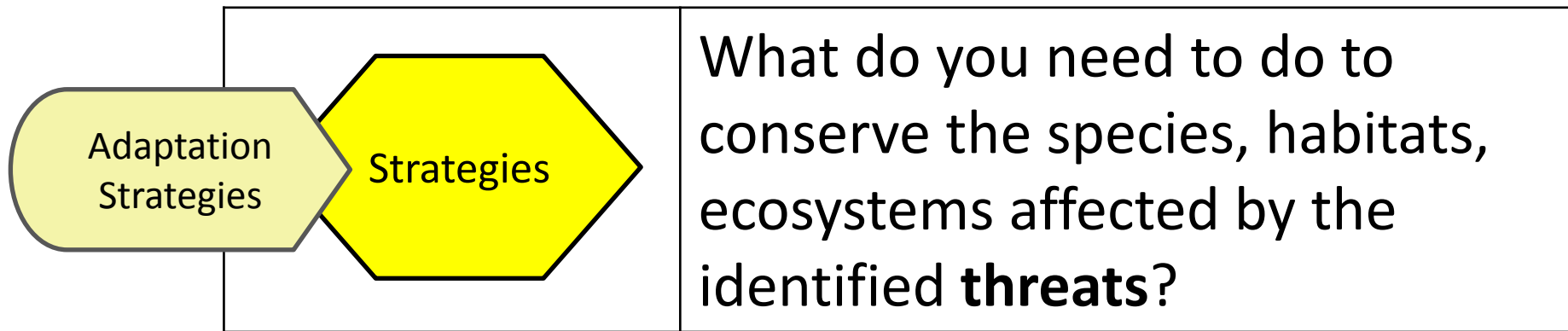
Could we identify where these common elements fit across agency planning processes?

Open Standards	SWAPs	ESA Recovery Plans	Refuge CCPs
	Elements 1 & 2	Scope of Recovery Plan	Affected Environment/ Refuge Resources
	Element 3	Reasons for Listing/ Threat Assessment	Planning Issues
	Element 4	Recovery Program	Management Direction/ Description of Alternatives

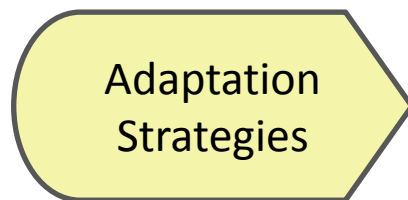
What are the climate considerations?

	What is the geographic or thematic scope of the plan?
	What species, habitats, ecosystems are you seeking to conserve or restore?
<p>Climate Considerations</p> <p>Consider how potential range shifts and changes in community assemblages affect the geographic scope or targets addressed in the plan</p>	

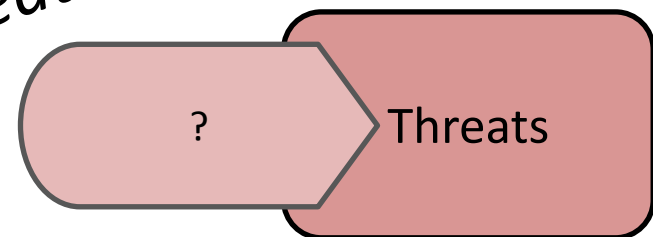
It's easy to want to jump straight to strategies because we want action!

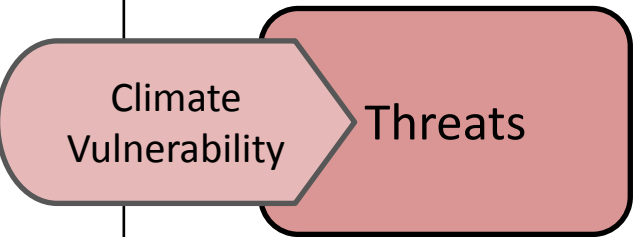
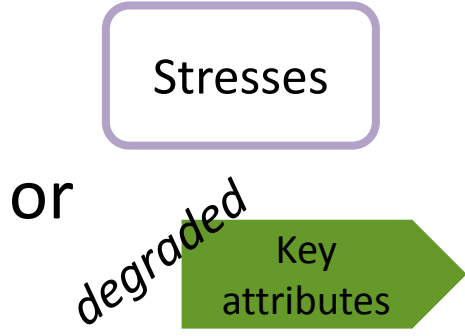


Effective strategies are linked to reducing specific threats
Or intervene by directly improving the condition of the target
(that has been degraded by some threat)



*We need the equivalent
of "climate threats"*



 <p>Climate Vulnerability</p> <p>Threats</p>	<p>What are the activities or processes that directly affect the species, habitats, ecosystems you seek to conserve?</p>
 <p>Stresses</p> <p>or</p> <p>degraded</p> <p>Key attributes</p>	<p>How do these activities cause destruction, degradation, or impairment of the condition of the conservation target? What are the key attributes of the target that are impaired by these activities?</p>
<p><i>Threat Ranking/Rating</i></p>	<p>What are the relative impacts of these activities?</p>
<p>Climate Considerations:</p> <ul style="list-style-type: none"> • Identify <u>specific</u> climate exposure factors that have the potential to reduce the condition of the target including both direct and indirect impacts • Identify the ecological impacts/resulting changes in condition of the target • Rank exposure factors against other human activities with respect to the impact on the target 	

Adaptation
Strategies

Strategies

Strategy Rating

What do you need to do to conserve the species, habitats, ecosystems affected by the identified threats?

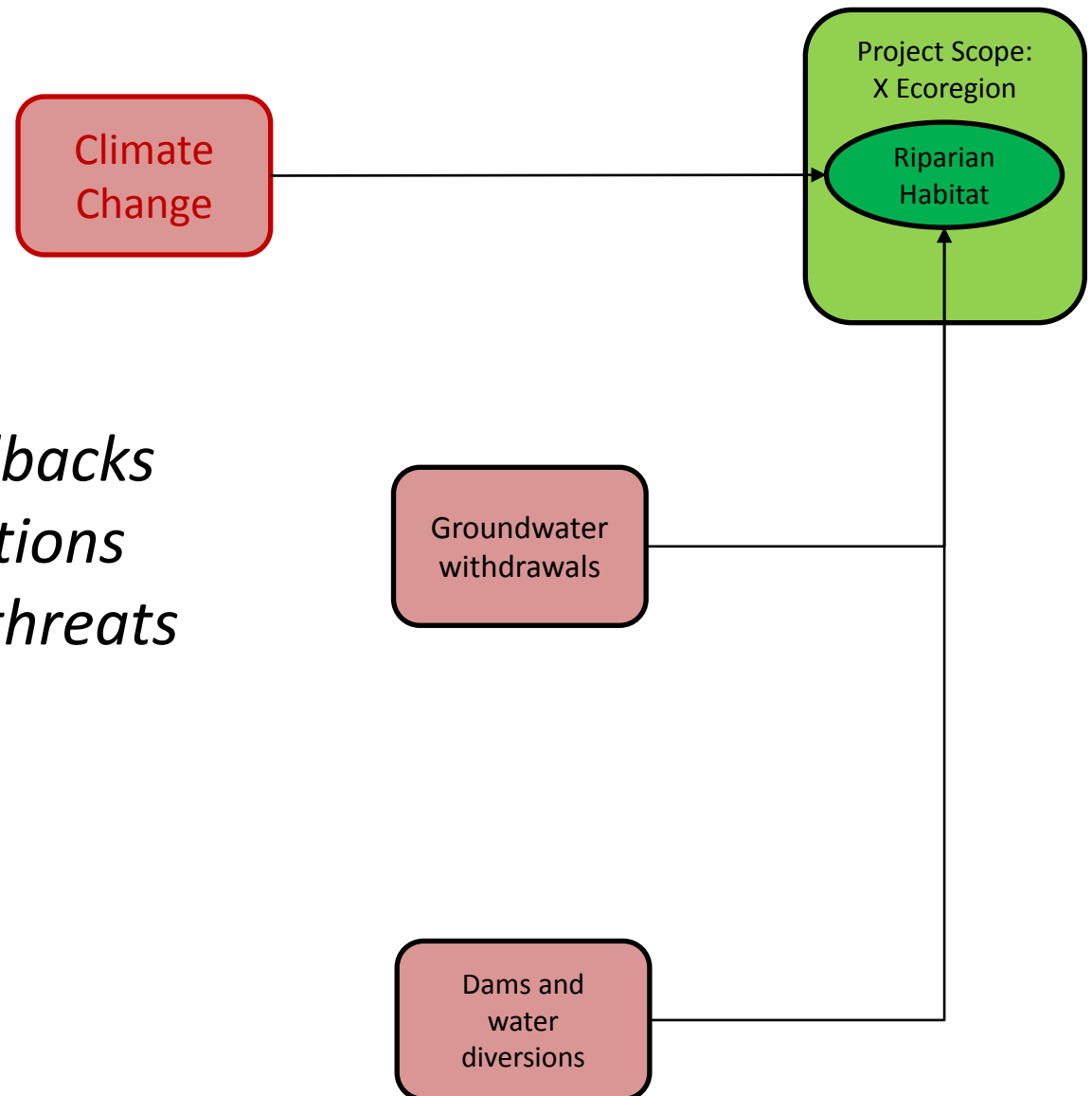
Which interventions are more likely to be most effective?

Climate considerations:

Identify intervention points for conservation strategies that address direct and indirect impacts on the conservation target associated with highly rated climate change exposure factors

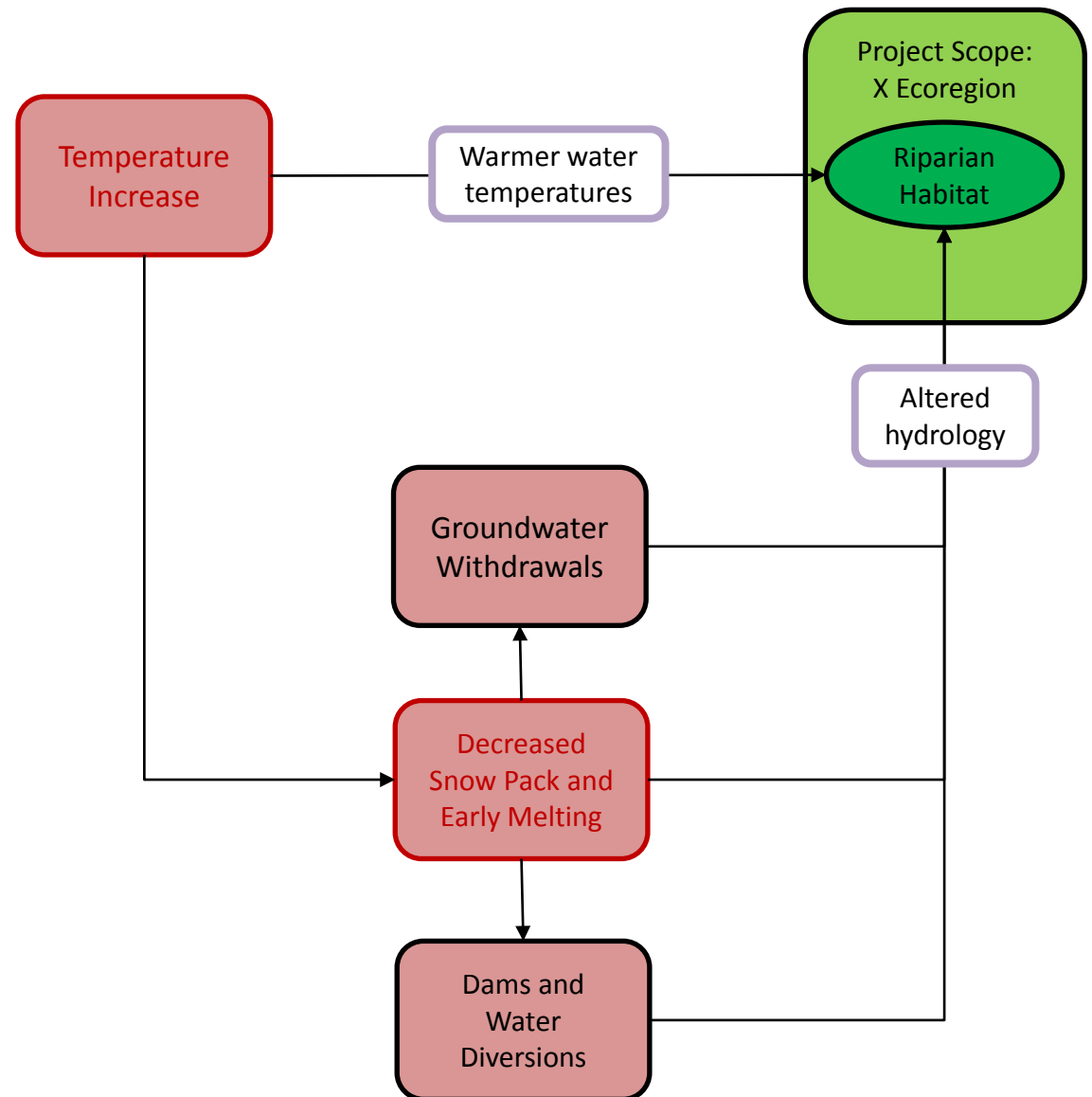
For resource use plans, plan should address potential interactive or synergistic impacts on planned use

Instead of this:



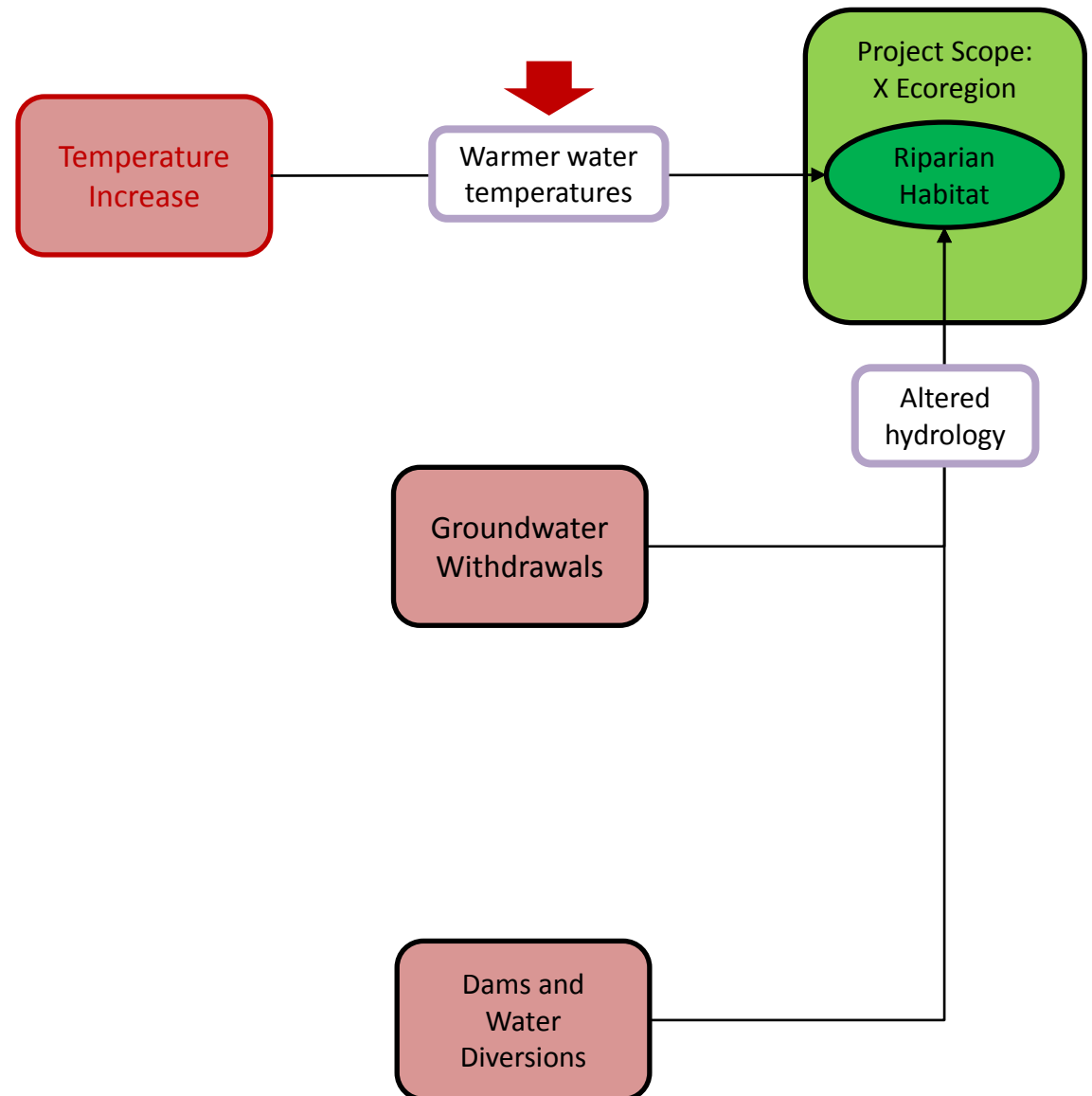
*Misses feedbacks
and interactions
with other threats*

Identify specific exposure factors and potential impact based on target sensitivity



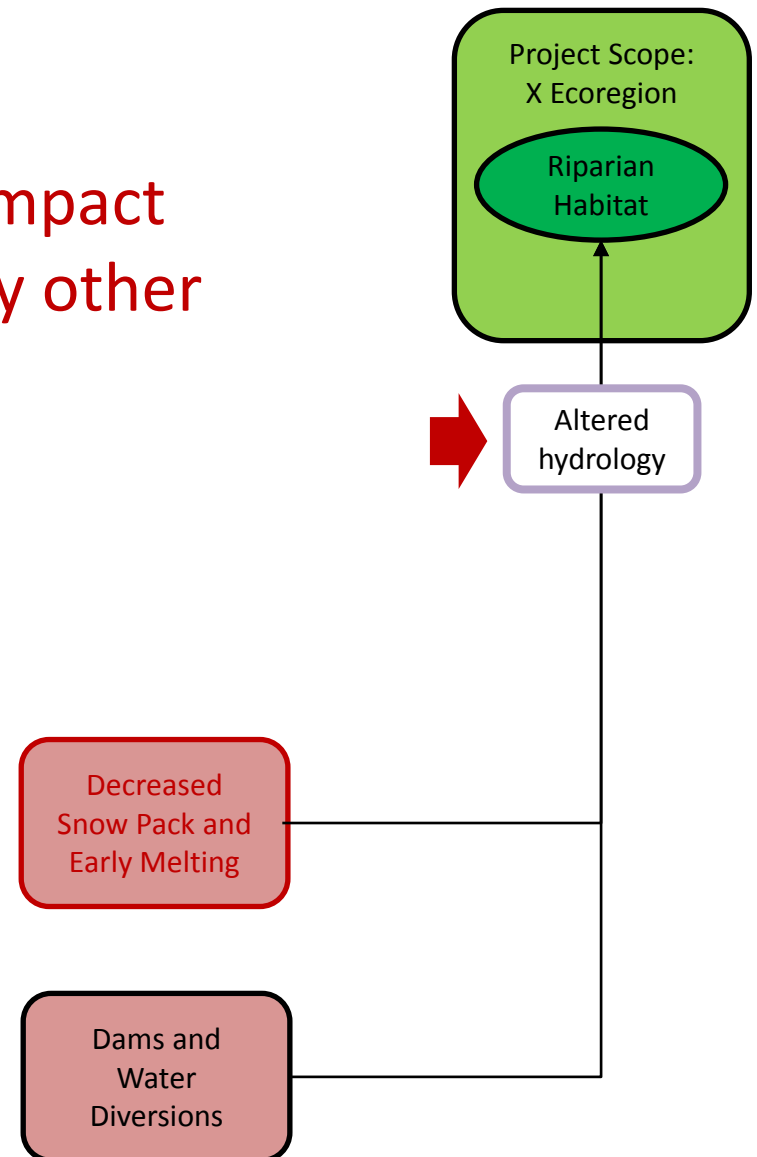
Changes in exposure

1. Affect the system in a new way



Changes in exposure

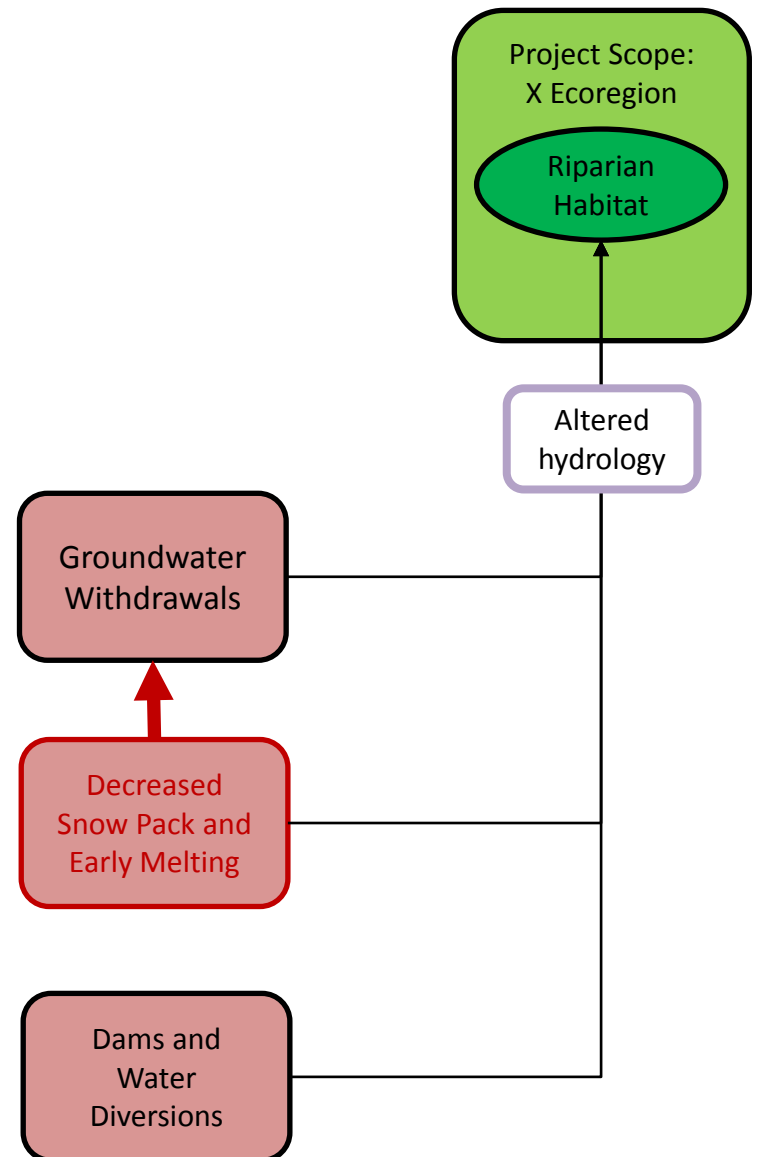
2. Compound the impact (stress) caused by other threats



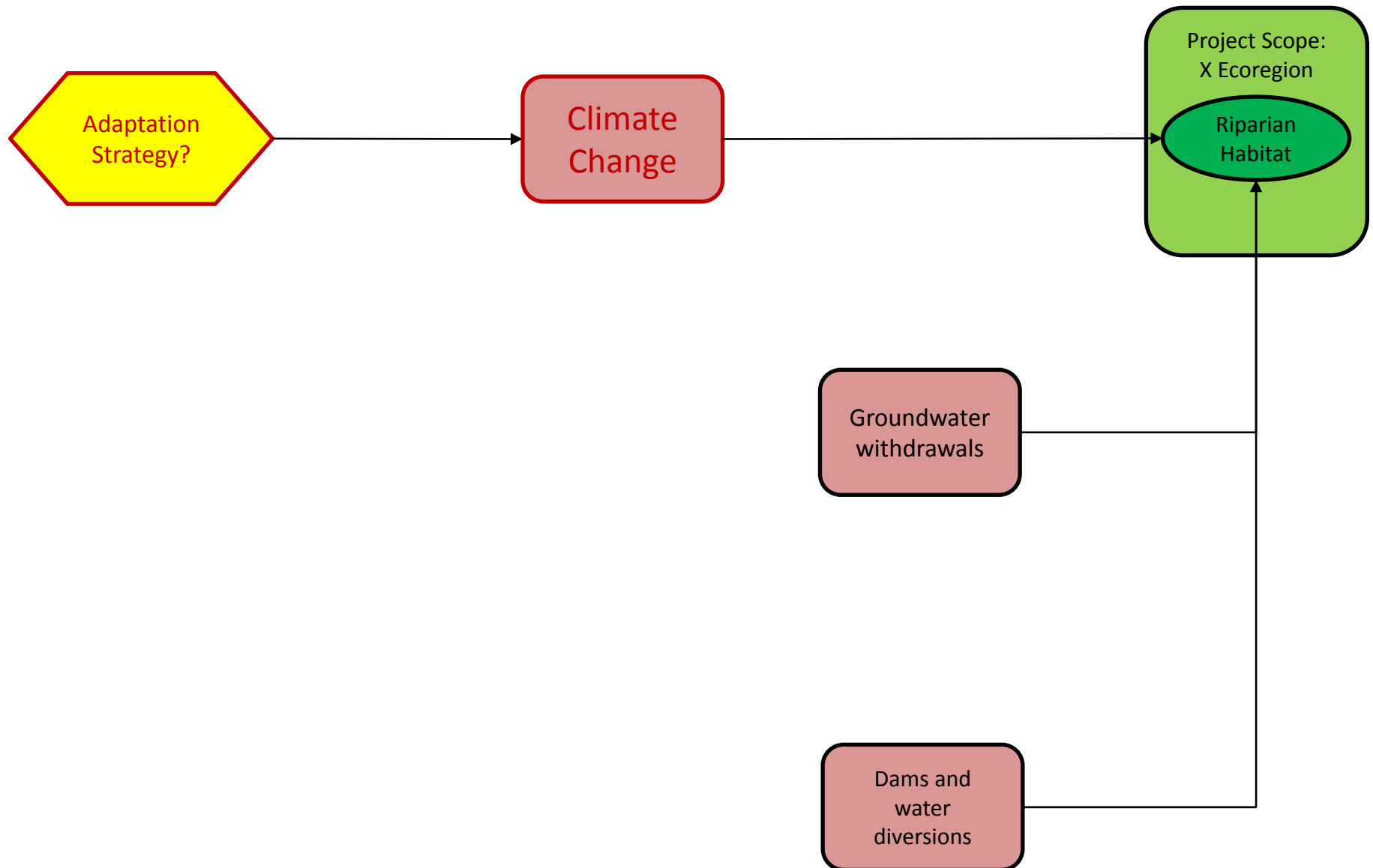
Changes in exposure

3. Exacerbate other threats

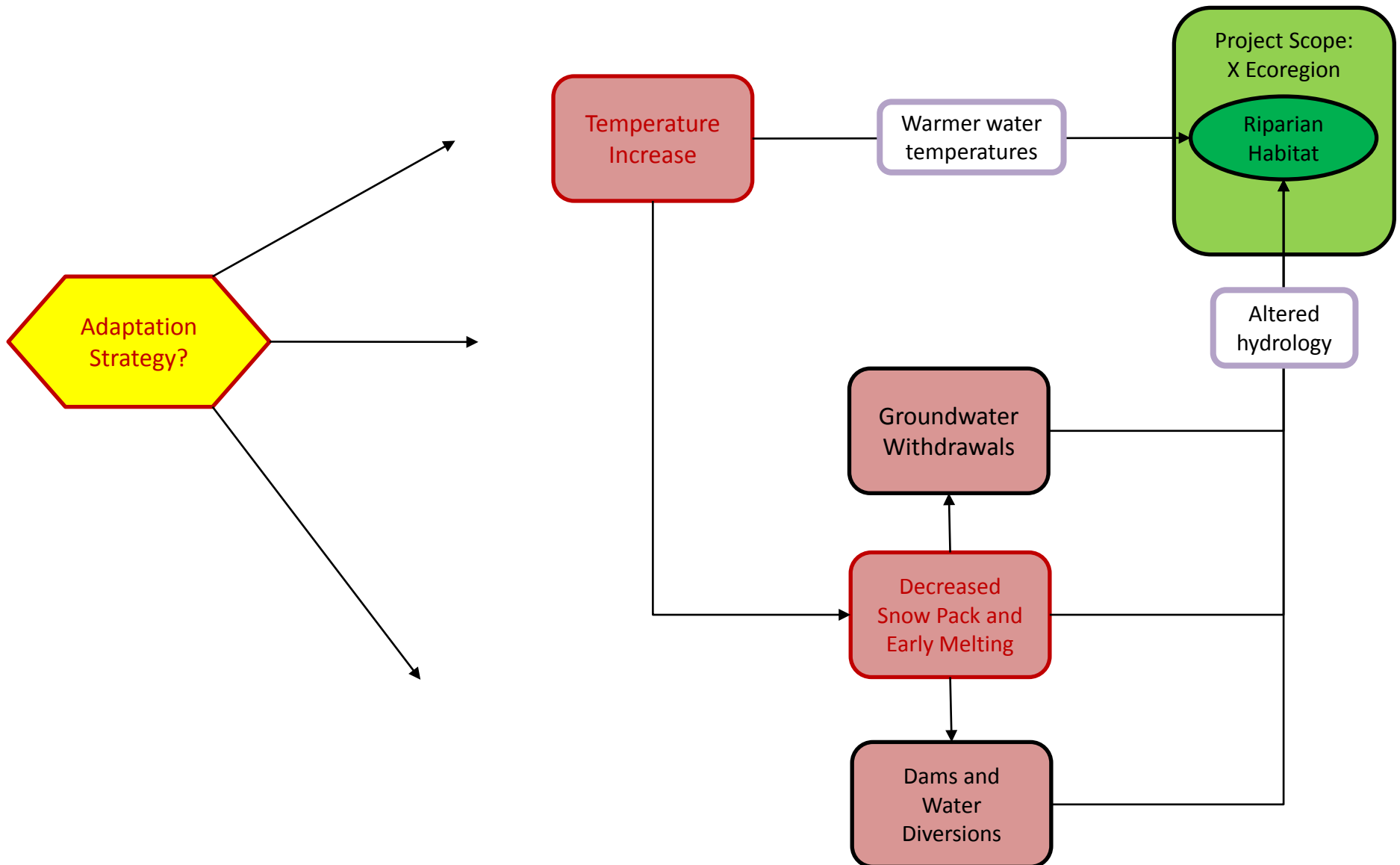
Human response to change in exposure makes existing threats worse



Instead of this:



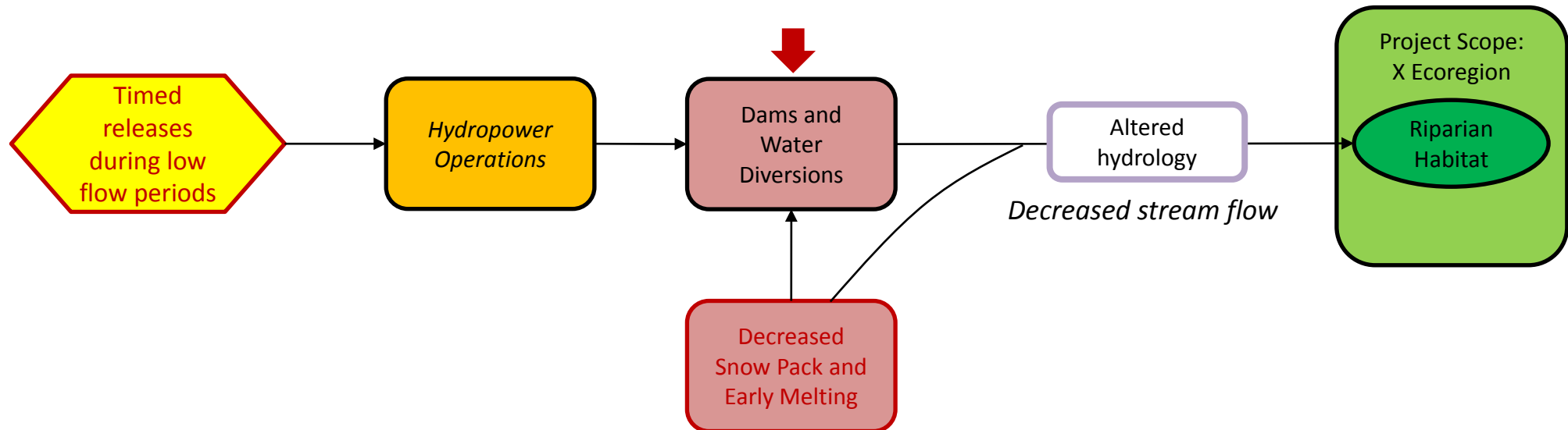
Climate Adaptation Strategies



Climate Adaptation Strategies

1. Adaptation strategies that reduce the magnitude of the stress/impact realized by the target

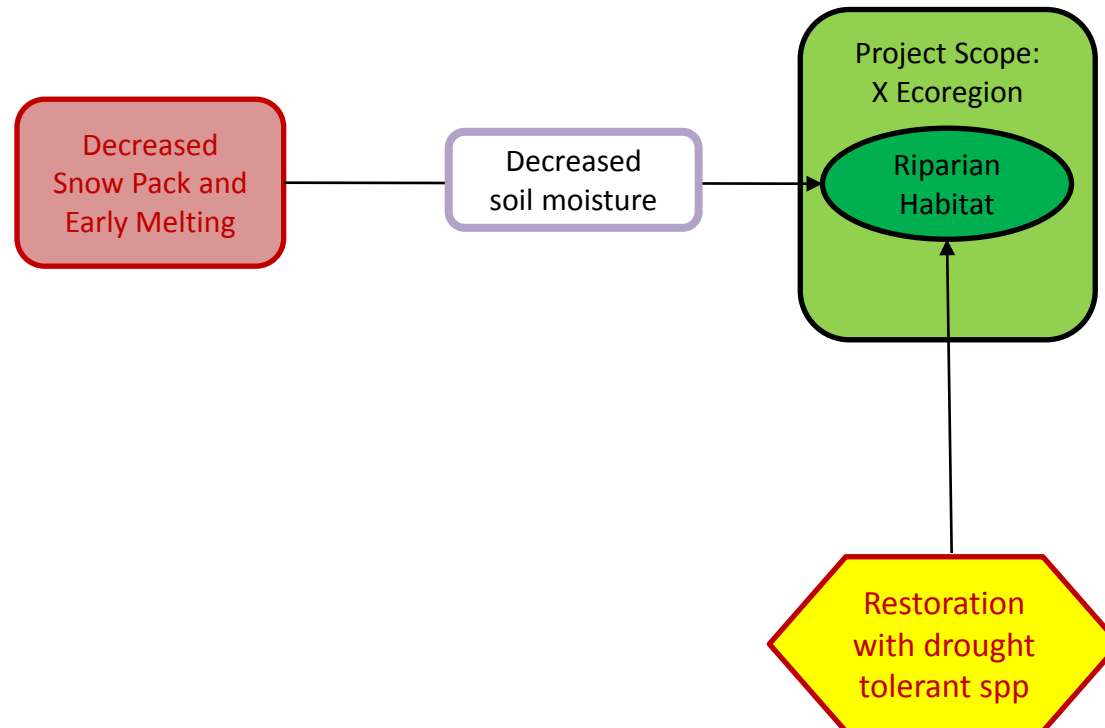
Intervention point #1: Intervene on a non-climate threat that **compounds the impact of** a climate factor. The adaptation strategy should specify how it will address the ecological consequence generated by the climate factor.



Climate Adaptation Strategies

1. Adaptation strategies that reduce the magnitude of the stress/impact realized by the target

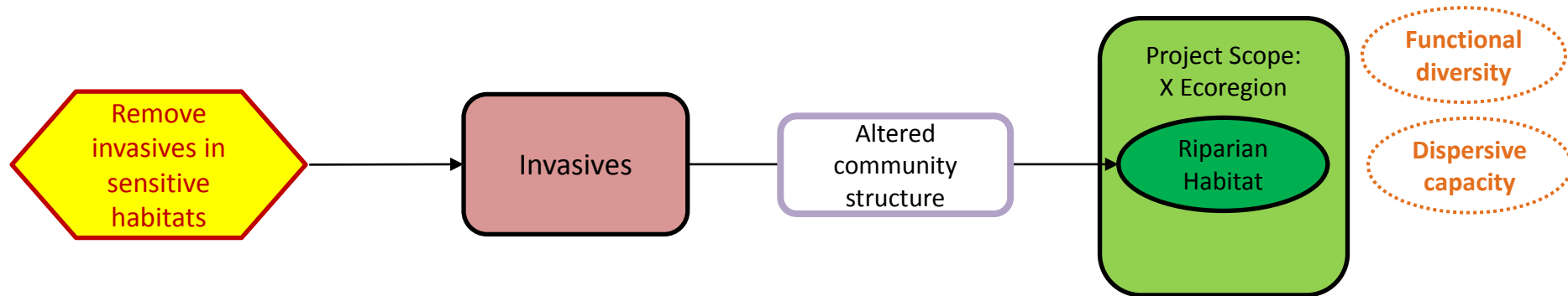
Intervention point #2: Intervene directly on the conservation target to **reduce the conservation target's sensitivity** to the climate factor or to **reduce the relative exposure** experienced by the target.



Climate Adaptation Strategies

2. Adaptation strategies that remove constraints to adaptive capacity

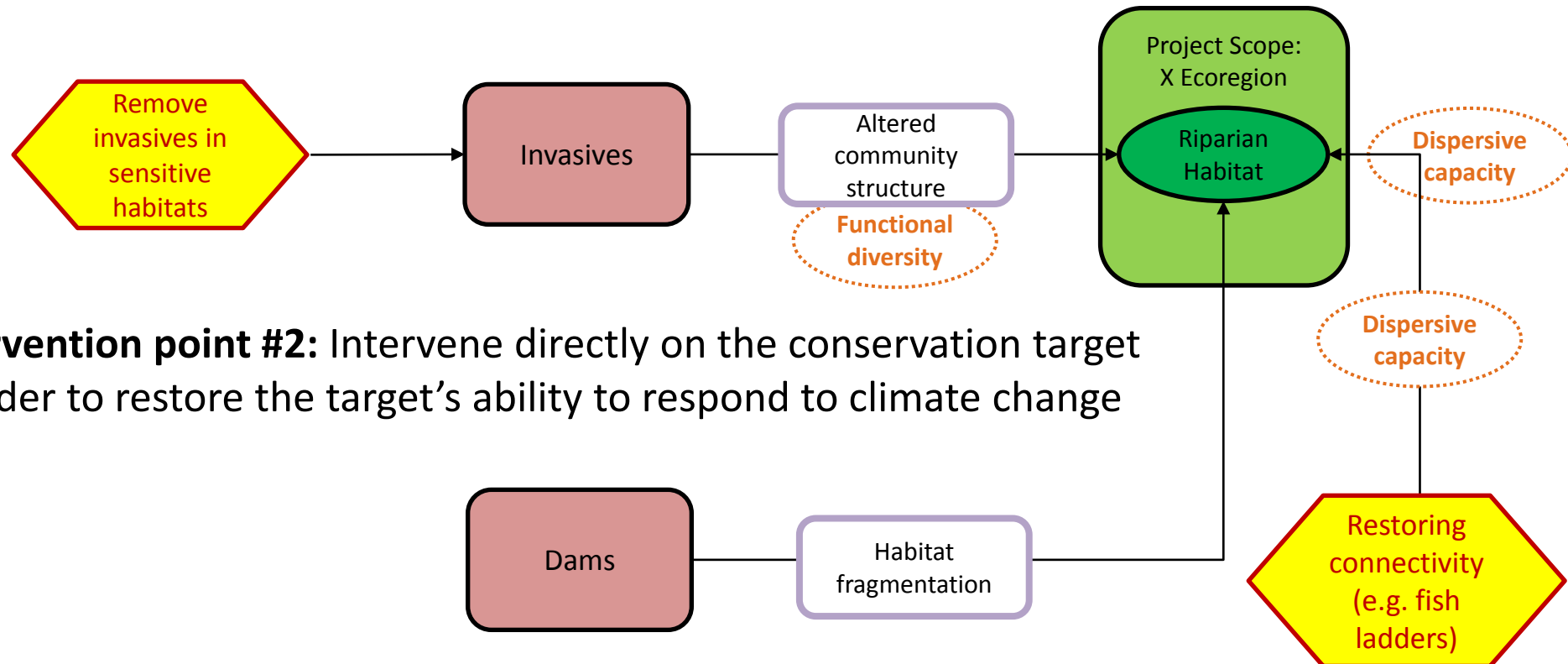
Intervention point #1: Intervene on any non-climate threats that are likely to limit the adaptive capacity of the conservation target



Climate Adaptation Strategies

2. Adaptation strategies that remove constraints to adaptive capacity

Intervention point #1: Intervene on any non-climate threats that are likely to limit the adaptive capacity of the conservation target

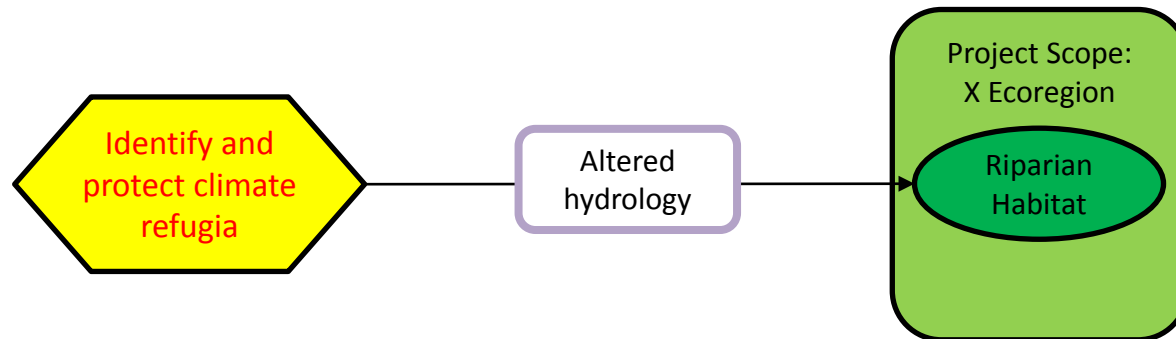


Intervention point #2: Intervene directly on the conservation target in order to restore the target's ability to respond to climate change

Climate Adaptation Strategies

3. Adaptation strategies that conserve current or future occurrences of the target relative to changes in exposure

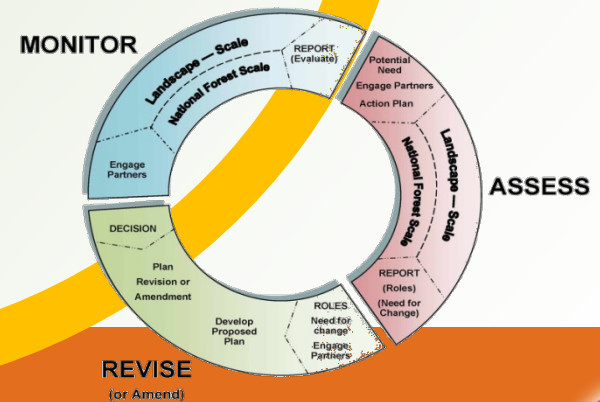
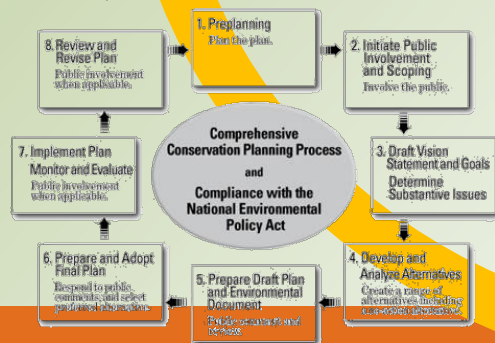
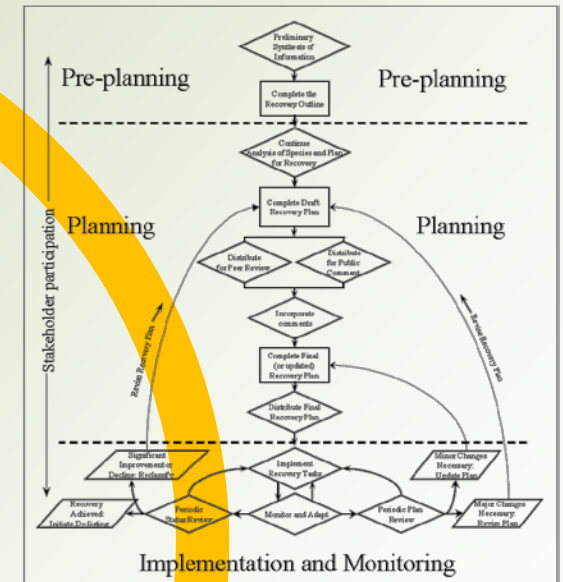
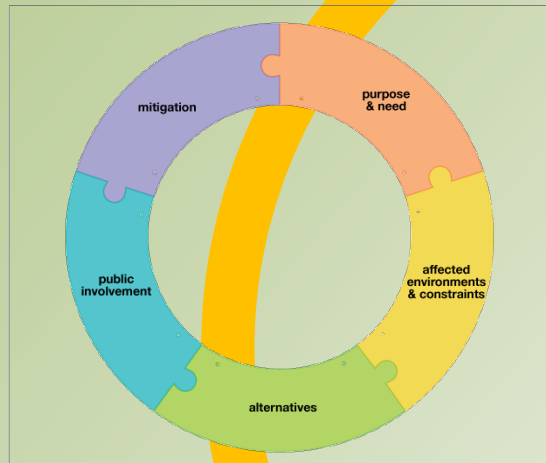
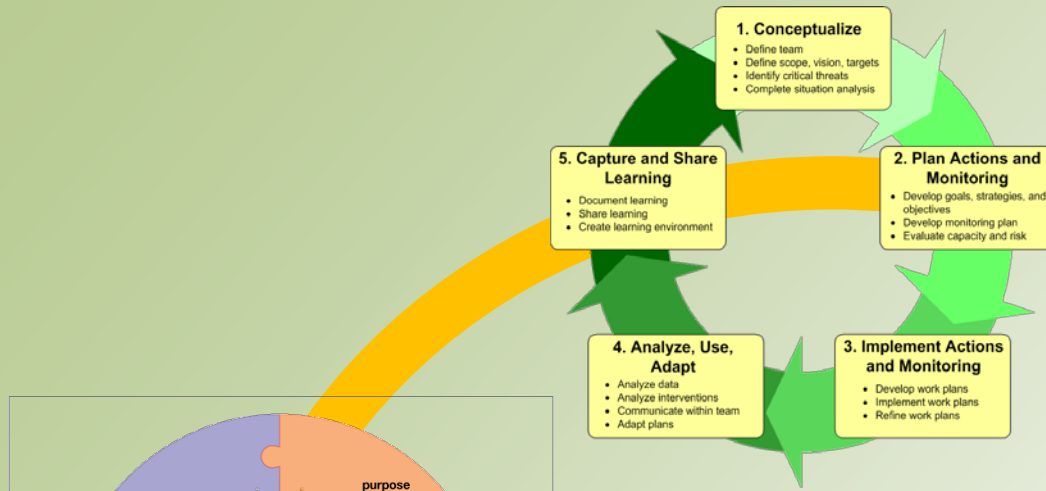
Intervention point : Intervene directly on the conservation target to protect or manage areas on the landscape where current occurrences are more likely to persist or future occurrences are projected to occur under climate change



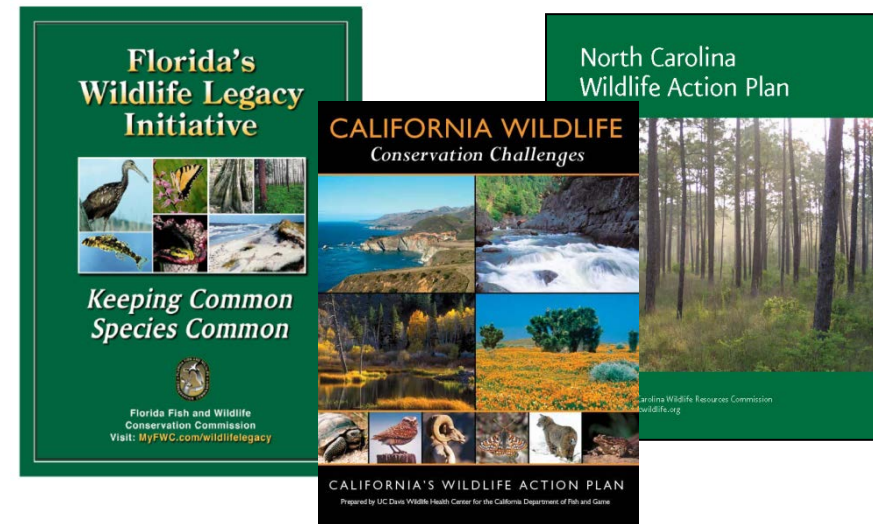
Climate Adaptation

- Does not require a completely new planning framework
- We can use a “general” conservation planning cycle to identify where and how to address climate considerations in specific contexts
- To effectively respond with appropriate **adaptation actions**, climate threats and impacts should be
 - Explicit in threat assessment
 - Rated alongside other threats
 - Ratings used to prioritize actions
- Adaptation becomes part of the process





State Wildlife Action Plans



- **State Wildlife Grants Program** supports state agencies in their efforts to prevent wildlife from becoming endangered
- **State Wildlife Action Plans** identify priority species and habitats and lay out the actions needed to conserve those resources

State Wildlife Action Plans

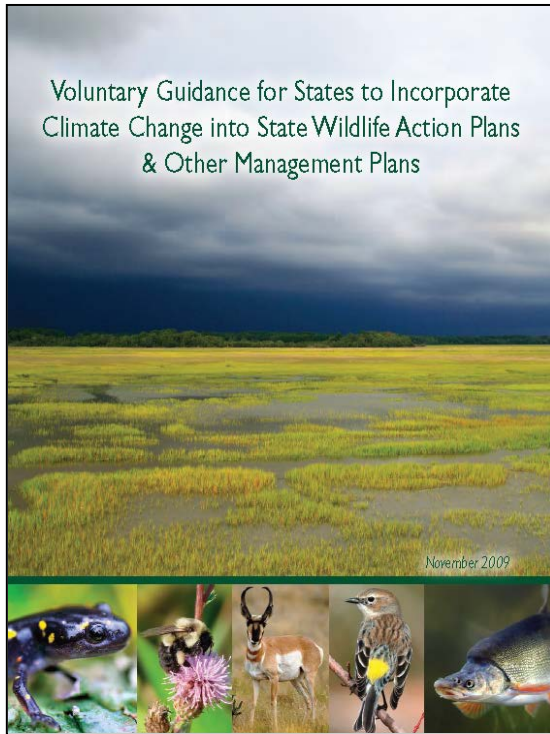
Required Elements

- Element 1: Species
- Element 2: Habitat
- Element 3: Threats
- Element 4: Actions
- Element 5: Monitoring
- Element 6: Review
- Element 7: Coordination
- Element 8: Public participation

- (1) Information on the distribution and abundance of species and wildlife that are indicative of the diversity of the State's wildlife
- (2) Descriptions of locations and relative condition of key habitats and community types essential to conservation of these species
- (3) Descriptions of problems which may adversely affect these species or habitats and priority research and survey efforts needed to identify factors which may assist in restoration and improved conservation
- (4) Descriptions of conservation actions proposed to conserve the identified species and habitats and priorities for implementation

AFWA Guidance

Climate Change Considerations



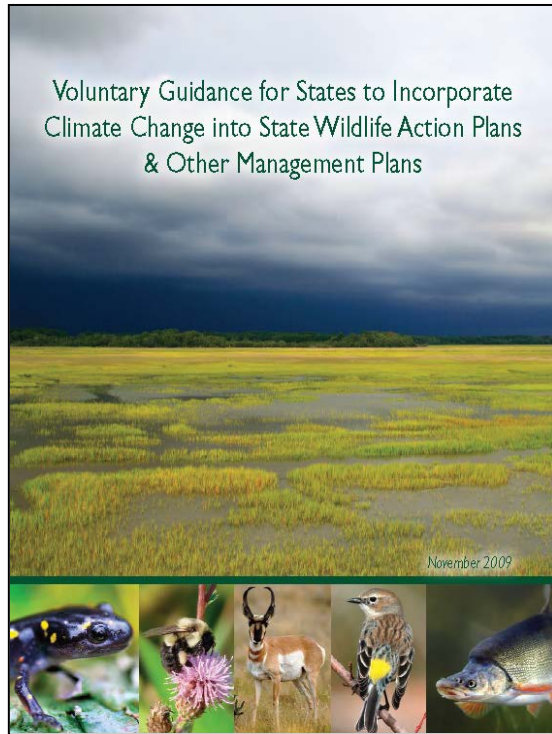
Association of Fish and Wildlife Agencies 2009

Element 1: Species

- Reexamine SGCN list to account for impacts of climate change on distribution and abundance of species (including implications of range changes)
- Use vulnerability assessments and species-based models to identify and describe impacts of climate change on species

Element 2: Habitats

- Consider how climate change will affect future abundance and distribution of habitat types as well as changes in structure and composition
- Use vulnerability assessments to identify and describe impacts of climate change on key habitats



Association of Fish and Wildlife Agencies 2009

AFWA Guidance

Climate Change Considerations

Element 3: Threats

- Consider climate change as a new problem for species and habitats, including potential direct and indirect impacts
- Review current threats, problems or impacts affecting wildlife through a climate lens
- Use a vulnerability assessment to identify and prioritize threats

Element 4: Strategies

- Consider developing conservation actions that specifically address the direct and indirect impacts of climate change on species and habitat
- Identify how conservation actions will be prioritized in consideration of multiple threats/stresses and increased uncertainty
- Identify which actions are intended to minimize climate change impacts, which will provide for wildlife adaptation, which will provide for resilience

Translating guidance

Based on early work to develop and test process with partnering state agencies

Florida Fish and Wildlife Conservation Commission



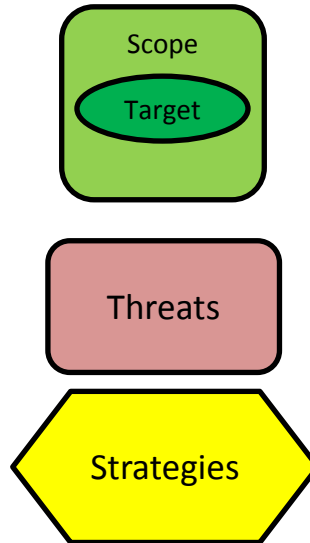
California Department of Fish and Wildlife



State Wildlife Action Plans

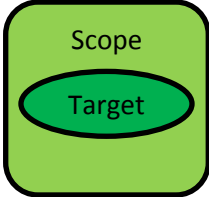


Required Elements

- Element 1: Species
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Rosetta Stone for SWAP Planning

Open Standards	Climate BMPS	SWAPs
	How range shifts or changes in communities affect target selection	Elements 1 & 2
	ID exposure factors ID ecological impacts Rank CC and non CC threats	Element 3
	ID intervention points on direct and indirect climate impacts	Element 4

Salt Marsh

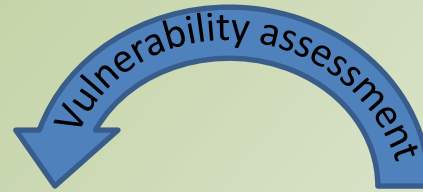


Threats		Sources of Stress	Habitat Source Rank	Related Stresses (see above)
1	Coastal development		Very High	A, B, C, E, I, K
2	Roads, bridges and causeways		High	A, B, I, K
3	Incompatible industrial operations		High	A, B, E, I, K
4	Dam operations/incompatible release of water (quality, quantity, timing)		High	A, C, D, E, F, H, I, J, K
5	Climate variability		High	D, G, H, K
6	Inadequate stormwater management		High	A, B, C, D, E, F, I, J, K
7	Surface water withdrawal		High	D, F, I, K
8	Channel modification/shipping lanes		High	A, B, C, F, H
9	Incompatible wildlife and fisheries management strategies		High	A, B, I, K
10	Management of nature (beach nourishment, impoundments)		High	A, B, D, E, K
11	Disruption of longshore transport of sediments		High	
12	Invasive plants	Medium		
13	Shoreline hardening	Medium		
14	Chemicals and toxins	Medium		
15	Industrial spills	Medium		
16	Utility corridors	Medium		
17	Boating impacts	Medium		
18	Military activities	Low		
19	Vessel impacts	Low		
20	Placement of artificial structures	Low		
Statewide Threat Rank of Habitat			Very High	

Stresses		Habitat Stress Rank
A	Habitat destruction	Very High
B	Habitat fragmentation	Very High
C	Sedimentation	Very High
D	Altered structure	Medium
E	Altered water quality–contaminants	Medium
F	Altered water quality–physical, chemistry	Medium
G	Altered weather regime/sea level rise	Medium
H	Erosion	Medium
I	Altered hydrologic regime	Medium
J	Altered primary productivity	Medium
K	Altered species composition	Medium



Element 3: Threats



Atlantic Salt
Marsh Snake

Exposure factor	Stress
Sea level rise	Habitat loss Altered hydrology
Stronger storms/hurricanes	Altered salt marsh regeneration
Tidal changes (higher high tides)	Habitat shifts/ Reduced habitat availability

Specific climate exposure factors that have the potential to reduce target's condition

Resulting changes in condition of target

Vulnerability factor	GI	I	SI	N	SD	D	unknown or n/a
<i>Sea level rise</i>	•					--	
<i>Natural barriers</i>				•	--	--	
<i>Anthropogenic barriers</i>	•				--	--	
Human responses to CC	--		•				
Dispersal				•			
Historical thermal niche (GIS)		•				--	
<i>Physiological thermal niche</i>				•	•	--	
<i>Historical hydrologic niche (GIS)</i>		•				--	
Physiological hydrologic niche	•	•				--	
Disturbance regimes	--		•				
<i>Ice and snow</i>				•	--	--	
<i>Physical habitat specificity</i>	--				•		
<i>Biotic habitat dependence</i>			•		--	--	
<i>Dietary versatility</i>	--		•	•		--	
<i>Biotic dispersal dependence</i>	--			•	--	--	
<i>Other interactions: hybridization</i>	--		•		--	--	
<i>Genetic variation</i>	--			•	•	--	
<i>Phenological response</i>	--					--	•

Element 4: Threats

Threat	Stress
Sea level rise	Habitat loss Altered hydrology
Stronger storms/ Hurricanes	Altered salt marsh regeneration
Tidal changes (higher high tides)	Habitat shifts/ Reduced habitat availability

Sources of Stress		Habitat Source Rank	Related Stresses (see above)
1	Coastal development	Very High	A, B, C, E, I, K
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3	Incompatible industrial operations	High	A, B, E, I, K
4	Dam operations/incompatible release of water (quality, quantity, timing)	High	A, C, D, E, F, H, I, J, K
5	Climate variability	High	D, G, H, K
6	Inadequate stormwater management	High	A, B, C, D, E, F, I, J, K
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8	Channel modification/shipping lanes	High	A, B, C, F, H
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10	Management of nature (beach nourishment, impoundments)	High	A, B, D, E, K
11	Disruption of longshore transport of sediments	High	C, H
12	Invasive plants	Medium	A, B, D, J, K
13	Shoreline hardening	Medium	A, B
14	Chemicals and toxins	Medium	E
15	Industrial spills	Medium	E
16	Utility corridors	Medium	A, B
17	Boating impacts	Medium	
18	Military		
19	Vessel		
20	Placem		
Statewide			
Stresses		Habitat Stress Rank	
A	Habitat destruction	Very High	
B	Habitat fragmentation	Very High	
C	Sedimentation	Very High	
D	Altered structure	Medium	
E	Altered water quality—contaminants	Medium	
F	Altered water quality—physical, chemistry	Medium	
G	Altered weather regime/sea level rise	Medium	
H	Erosion	Medium	
I	Altered hydrologic regime	Medium	
J	Altered primary productivity	Medium	
K	Altered species composition	Medium	

Identify existing threats that compound climate-related stresses

Element 4: Threats

Threat	Stress
Sea level rise	Habitat loss Altered hydrology
Stronger storms/ Hurricanes	Altered salt marsh regeneration
Tidal changes (higher low)	

Identify feedbacks with
existing threats

Sources of Stress		Habitat Source Rank	Related Stresses (see above)
1	Coastal development	Very High	A, B, C, E, I, K
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C	Sedimentation	Very High	
D	Altered structure	Medium	
E	Altered water quality–contaminants	Medium	
F	Altered water quality–physical, chemistry	Medium	
G	Altered weather regime/sea level rise	Medium	
H	Erosion	Medium	
I	Altered hydrologic regime	Medium	
J	Altered primary productivity	Medium	
K	Altered species composition	Medium	

Element 5: Actions

HABITAT MANAGEMENT: Dredge soils to minimize impact of SLR and tidal changes on hydrology

PLANNING: Re-zone areas adjacent to existing marsh to prevent development in existing habitat migration corridors

HABITAT MANAGEMENT: Facilitate transition of inland marshes to salt marsh in response to changes in hydrology

1. **Adaptation strategies that reduce the magnitude of the stress realized by the target**
2. **Adaptation strategies that remove constraints to adaptive capacity**
3. **Adaptation strategies that conserve current or future occurrences of the target relative to changes in exposure**





Incorporating Climate Change Into the California State Wildlife Action Plan

Whitney Albright, California Department of Fish and Wildlife, whitney.albright@wildlife.ca.gov
Natalie Dubois and Judith Boshoven, Defenders of Wildlife
Amber Pairs and Armand Gonzales, California Department of Fish and Wildlife



Background

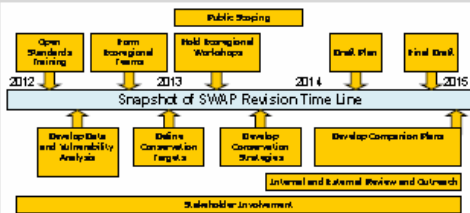
- ❖ The California Department of Fish and Wildlife (CDFW) is revising the California State Wildlife Action Plan (SWAP)
- ❖ CDFW worked with partners to develop a process for integrating climate change into the SWAP using the Open Standards for the Practice of Conservation
- ❖ CDFW is engaging partners and stakeholders in ecoregional assessments that will be rolled up into the state-wide strategy

The California State Wildlife Action Plan



The federal **State Wildlife Grants Program** supports state agencies in their efforts to prevent wildlife from becoming endangered. Each state has developed a **state wildlife action plan (SWAP)** to identify priority species and habitats and lay out the actions needed to conserve those resources.

The California State Wildlife Action Plan, released in 2005, was one of only a few state plans to include climate change as a major stressor affecting fish, wildlife and their habitats. The plan revision is scheduled to be completed by 2015 and will incorporate the most current scientific information on climate change including research and adaptation strategies. The revision will also incorporate new information developed through updates to Species of Special Concern reports for birds, mammals, reptiles, amphibians and fish, and update and analyze the threats and actions affecting fish and wildlife on multiple scales. More information online at www.dfg.ca.gov/SWAP



CDFW Climate Science Program

- ❖ Through an approach that embodies the theme Unity-Integration-Action, CDFW is laying the ground work for a proactive, adaptive, and collaborative approach to safeguarding California's fish, wildlife, and habitats for years to come.
- ❖ This program has a role in helping to integrate climate change into the SWAP revision process.
- ❖ Get Involved! Contact climatechange@wildlife.ca.gov to join the CDFW Climate Stakeholder Group and listserv.

SUCCESS THROUGH INNOVATION

- ❖ On March 7-9, 2012 Defenders of Wildlife staff helped facilitate a training for CDFW staff using the **Open Standards for the Practice of Conservation** as a platform the California State Wildlife Action Plan Update. The workshop was attended by over 70 CDFW staff and partners.
- ❖ As part of this process, CDFW staff are working with partners to identify threats to conservation targets and incorporate a **climate vulnerability assessment**. As a result, **conservation strategies** will now include actions to address the impacts of climate change.

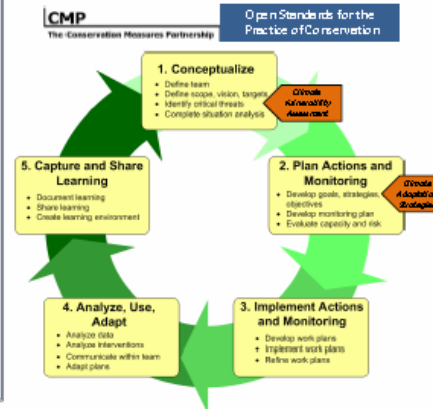


SUCCESS THROUGH PARTNERSHIP

- ❖ The **SWAP Climate Workgroup**, led by CDFW's Climate Science Program, provides a mechanism for stakeholder input and support to integrate climate change into the SWAP revision process. The group includes representation from state and federal agencies, conservation NGOs, industry, and land trusts.

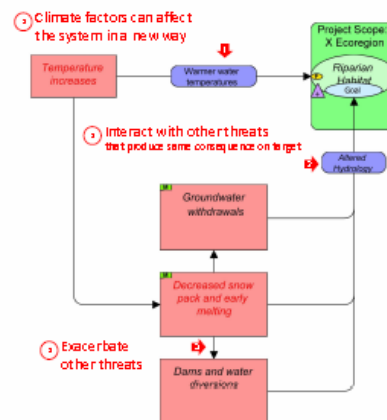
Accomplishments

- ❖ Compiled references and supporting data for projected climate changes and impacts for each ecoregion in California for use by SWAP teams
- ❖ Identified partners with climate expertise by region
- ❖ Created a new website to provide ready access to compiled resources www.dfg.ca.gov/Climate_and_Energy/Climate_Change/Activities/SWAP.aspx
- ❖ Working group members are committed to working with CDFW ecoregional teams throughout the revision process



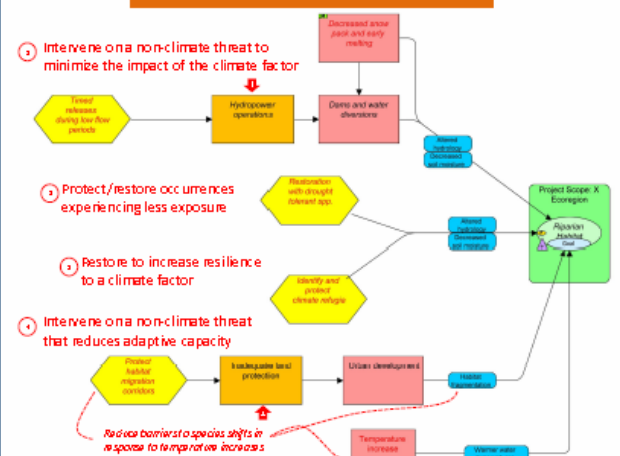
Incorporating Climate Vulnerability in the Threat Assessment

What are the impacts to species and habitats?



Identifying Climate Adaptation Strategies

How can we adjust our conservation strategies to limit or reduce vulnerability?



- Climate considerations can be built into the existing “Elements”
- Adaptation becomes an integrated part of the process
- Targeting the most appropriate adaptation strategies requires:
 - Climate threats and impacts to be made explicit
 - Rated alongside other threats (currently not required)
 - Ratings used to prioritize actions

